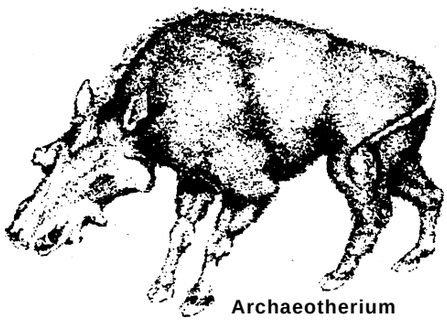
The Pig Dig

Critical Resource Issues
Badlands National Park
P.O. Box 6
Interior, South Dakota 57750

Paleontology in Action

First, we would like to thank you. Your entrance dollars have funded another field season at the Pig Wallow Site, affectionately nicknamed the Big Pig Dig. The National Park Service, working with South Dakota School of Mines and Technology (SDSMT), will work from early June through late August to expose more mysteries buried deep within the Badlands strata. The excavation started in June, 1993 when two visitors from Iowa discovered a large backbone protruding from the ground near the Conata Picnic Area. Fortunately for all of us, these visitors followed the correct procedure: they left the bones undisturbed and contacted staff at the Ben Reifel Visitor Center. Although fossils are common in the Badlands, the newly discovered site sparked the interest of the park staff. Originally thought to be a four day excavation, the site is now in its seventh season of field work.

An African Watering Hole in South Dakota



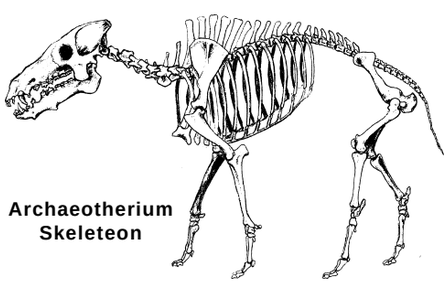
Archaeotherium

The site's name, the Pig Dig, comes from that first exposed fossil, originally though to be the remains of an ancient piglike mammal called *Archaeotherium*. It was later identified as a *Subhyracodon*, an aquatic rhinoceros but the name "Big Pig Dig" stuck. Rhinoceroses are found today in Africa and Asia but smaller, hornless versions once lived in the Badlands. *Archaeotherium* has been found at the site, as well as multiple specimens of ancient horses, and deerlike creatures. The horses found are three toed and about the size of a collie dog. The tiny *Leptomeryx* resembles a deer standing only a foot high. More than 5000 bones have been excavated from the site for research purposes.

Why so many animals in one small place? Scientists believe that the area was once a spring-fed watering hole, similar to the large watering areas used by African game today. As the climate began to change to semi-arid, the creatures had to travel longer and longer distances to find water. Some perished as they fought to survive after being mired in the soft sediments. Opportunistic animals were drawn to feed on the dead carcasses. *Archaeotherium* was a scavenger, feeding on both plants and flesh. These large creatures trampled the site, deeply imbedding some bones and breaking up skeletons. Taphonomy is the study of how fossils are formed and preserved. Taphonomists working at the Pig Dig study the position and condition of bones at the site. These scientists attempt to interpret the activities of animals and try to puzzle out the conditions under which death occurred.

The Tip of the Iceberg

Fieldwork has a glamorous reputation from movies like *Jurassic Park*. Firmly in our minds is the idea of sun-burnt scientists diligently working to uncover huge fossilized bones belonging to the great dinosaurs. However, reality is that for every hour of fieldwork, fossil preparators and other scientists spend twelve or more hours in a laboratory cleaning, repairing, and identifying each specimen. Prehistoric creatures range in size from huge dinosaurs to microscopic insects. A single specimen may fill a storage building or one hundred specimens may fit inside a film cannister.

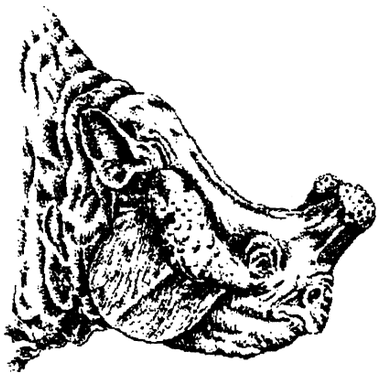


Archaeotherium Skeleteon

After labwork is completed, fossil specimens are maintained in storage facilities for research purposes or for display in museums and similar educational facilities. Each specimen is assigned a unique number for the larger collection of which it is a part. This process of cataloguing specimens includes critical information such as where the specimen was found, when it was found, and identifies it with as much detail as possible. This process enables scientists of the future, who may have more information or improved technology, to continue to work toward solving the mysteries of the paleontological past.

When you visit the Pig Dig, you are seeing the very careful, somewhat tedious work necessary for careful science. The paleontologist's tools of choice are soft-bristled brushes, dental picks, and small trowels. You may see field specimens being "jacketed," or carefully encased in a plaster cast for transport to the storage facility to await preparation for study or display.

Birth of A Science



***Brontothere*, the first Badlands creature discovered in 1846**

The White River Badlands have been studied for over 150 years and are known as one of the richest mammal fossil beds in the world. In 1846, Dr. Hiram Prout, a St. Louis, Missouri physician, described and illustrated the first vertebrate fossil from the White River region. The following year, Dr. Joseph Leidy described fossils from the same area. The stampede to the Badlands and the era of the Great American Fossil Hunters began. Names synonymous with North American paleontology, such as Edward Drinker Cope, O.C. Marsh, and Ferdinand V. Hayden, have been associated with Badlands research. The Cope-Marsh feud is legendary and is itself the subject of several books. These early paleontologists came from diverse backgrounds but a shared passion for studying these remnants of ancient life. The first scientist to publish their findings received the authority to name the creature, if yet unnamed, and gained status for their sponsoring organization or financial sponsor. In fact, the Badlands of South Dakota are considered to be the birthplace of the science of North American vertebrate paleontology. Important research continues today. Colleges and universities from across the continent come here to study the landscape and interrelate the geology with past climates and ecosystems. Sites like the Pig Dig continue to be significant sites whose boundaries have yet to be set.

The Mystery of the Missing Mammals

***Hoplophoneus* skull (Saber-toothed cat)**

Simply put, a fossil is a preserved sign of ancient life. Paleontologists study animal tracks and plants preserved over time, as well as bone that has been converted into fossil through natural chemical processes. Additionally, other signs such as feces and pollen have also been fossilized and are studied to help get a broader picture of life in prehistoric North America. Paleontology is a science shrouded in mystery; however, it is not a science that can work in a vacuum. Geologists have examined the individual rock layers contained within the Pig Dig to study the chemistry of the layers and the relationship between the fossils and the surrounding strata. Evolutionary biologists use specimens from the Badlands and compare them to relatives living today to try to create the path of change and adaptation that permitted some animals to thrive and others to become extinct.

The Pig Dig is an excellent example of the questions professionals have to answer: *What events led to this large conglomeration of dying animals in one place?* Oreodonts are the most common mammal found in the Badlands but no remains have been found in this site. *Why are there no oreodonts found at the site?* If the site was indeed a watering hole, it should have drawn active predators, as well as scavengers. *Why have no predators like the Hyenadon (a carnivore ancestor) and Hoplophoneus, better known as the saber-toothed cat, been found here?*

Becoming a Part of Paleontology

You are invited to visit the Pig Dig located adjacent to the Conata Picnic Area this summer. To find the site, travel the Badlands Loop Road and turn onto the Conata Road, located 16 miles north of the Ben Reifel Visitor Center. The site is staffed daily from early June through late August by student paleontologists from the South Dakota School of Mines and Technology in Rapid City and National Park Service rangers or interns. They will answer your questions as they work. In turn, they will be working toward answering critical questions that may someday help us better understand our world.

You can help protect paleontological resources here and anywhere you travel by following these tips:

☞**Leave fossils where you find them.** It's tempting to pick them up and take them with you but don't. Removing them from their context destroys much of the information critical to scientists. Context refers to where they are found geologically and in what position the fossils are found.

☞**By removing fossils, you have also committed a crime.** Fossils are a non-renewable resource protected in national parks like all other resources. Other public lands have similar regulations.

☞**Be an informed visitor.** Be familiar with current issues in paleontology. Once you watch for fossils in the news, you'll find them discussed almost daily.

☞**Support research through donations.** Donations can be made to paleontology research or education. Call (605) 433 - 5240 for more information.